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Rupture of the interface between two fluids in presence of surface agents MATTHIEU ROCHE[1], MOUNIR AYTOUNA[2], DANIEL BONN, HAMID KELLAY — Rupture of interfaces between two fluids is ubiquitous in everyday life. It is well established that this process is driven by three stresses: capillarity, viscosity and inertia. The effects of viscosity and inertia have been widely studied, whereas capillary effects have attracted less attention. We present results concerning the rupture of an interface in the presence of surface agents. Ruptures in the presence of a surfactant (SDS) and in the presence of a mixture of surfactant (SDS) and polymers (PVA) have been studied. In both cases, surface agents are diluted in the outer fluid. All experiments have been carried out using a microfluidic flow-focusing device. In the former case, the thinning dynamics of the neck behind the droplet exhibits two modes of thinning, depending on the external flow rates, and the surfactant concentration. These modes can be related to dynamic surface tension phenomena. In the latter case, the thinning slows down exponentially in the late instants. Structures analogue to beads-on-a-string also develop. This is very similar to what is reported for the breakup of polymeric jets, though polymers are outside the jet in our case.

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